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Class Size in the Primary School Years

(Kindergarten - Grade Three)

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Studies of the effects of class size on children's learning have been conducted throughout the twentieth century involving nearly a million students. This article summarizes the professional literature on the effects of class size on primary grade children's learning and how it corresponds to the NAEYC's developmentally appropriate guidelines. Then, class size reduction policies such as hiring an additional teacher, implementing tutoring programs, or grouping students differently throughout the day to reduce class size during reading and math classes are presented. This article was written to help those who are involved in early childhood programs understand the many benefits that children gain from being in small classes during their primary school years.

The Iowa Department of Education has developed a plan called Iowa Vision for Early Childhood. In the plan, it defines early childhood as children from birth to eight years of age. In an elementary school setting, this age range for early childhood would be kindergarten through grade three. Section III of the DOE plan provides class size and staff/child ratio guidelines for early childhood (Iowa Vision for Early Childhood, 1991). The DOE recommendations for maximum public school class size and adult/child ratio for kindergarten through grade three are listed below:

Maximum Public School Class Size	Staff/Child Ratio
At-Risk Prekdgn: 16 children	At-Risk Prekdgn: 1-8 children
Prekdgn: 20 children	Prekdgn: 1-10 children
Kindergarten: 22 children	Kindergarten: 1-18 children
Grades 1: 22 children	Grades 1: 1-18 children
Grades 2: 22 children	Grades 2: 1-18 children
Grades 3: 24 children	Grades 3: 1-20 children

The weighted factor assigned to a child should follow the child into all classrooms. Children with special needs are weighted according to the services they receive. Children with a level one rating may receive services for the resource room, speech, occupational therapy, or physical therapy. A level two weighting is for children who not only need services provided in level one, but in addition, may need a paraprofessional or some

type of extra equipment not already in a school system (e.g., hearing devices for classroom or braille computer). Students who are sent to other school systems or hospitals for their education may be weighted as a level three student. For special needs children, the ratios need to be adjusted and additional staff is needed if the special needs students are placed in a regular classroom setting.

An important function for the classroom teachers in my public school district to perform is advocacy for the young children in the community because they have no voice. In a combined effort, parents and teachers worked together to present information on class size. This collaboration occurred during the spring months of 1997 when kindergarten round-up took place. Local parents voiced their concerns about the class size if only two sections of kindergarten were available with 28 students in each section. One parent called the state universities to talk to early childhood professors to gain information on class size recommendations for kindergarten. The classroom teachers gathered research and wrote a letter to each school board member and administrator. The teachers also asked to be put on the board agenda for the monthly meeting in May to report research findings on class size in early childhood classrooms. The area preschool teacher informed the parents to attend this school board meeting to show support for reduced class size in the primary grades.

The recommended guidelines from the DOE, along with an article about class size distributed to school personnel and school board members (Bain & Jacobs, 1990), parental support, and educators speaking for the guidelines at a school board meeting influenced the board's vote in favor of smaller class sizes for the kindergarten class of 1997-98. Reflecting on the beginning stages of our faculty's quest for smaller classes in the primary grades, it seemed difficult for some of our community members to understand the benefits of smaller classes for young children. More amazing was the lack of support from our administration and school board members: They were unaware of the research that had been done on class size; therefore, it was our duty as classroom teachers to present information on class size that would help them make informed decisions on this issue for our community.

Since our school's move to reduce class size, another nearby school district has also addressed this issue. If two communities within a few miles of each other have been dealing with this concern, there must be many more communities that also are either proposing the reduction of class size or that need to be. Therefore, the purpose of this article is to summarize the professional literature on the effects of class size on primary grade children's learning: (a) studies of the effects of class size, and (b) class size policies.

Studies of the Effects of Class Size

Studies of the effect of class size on children's learning were conducted throughout the twentieth century involving nearly a million students (Glass, Cahen, Smith, Filby, & Nikola, 1982; Harder, 1990). The National Association for the Education of Young Children (NAEYC) has had a significant impact on the issue of class size in the primary grades. The NAEYC, organized in 1926, is an organization of early childhood educators. NAEYC's purpose is to be an advocate for young children. Its efforts have primarily been focused on developmentally-appropriate programs for young children. In 1986, NAEYC described developmentally appropriate and inappropriate practices at the primary-level in a position statement (Bredekamp & Shepard, 1989). Within the position statement, appropriate and inappropriate grouping and staffing for early childhood programs are discussed. NAEYC states under appropriate practice: "Groups of 5-, 6-, 7-, and 8-year-olds are no larger than 25 with 2 adults, one of whom may be a paraprofessional, or no larger than 15 to 18 with one teacher" (Bredekamp, 1988, p. 78).

Within the same time frame as the publication of the NAEYC guidelines, two major studies on class size in early childhood classrooms were conducted. These studies were the PRIME TIME Project and Tennessee's Student/Teacher Achievement Ratio Project (STAR).

State-Sponsored School Studies of Class Size

The Prime Time project was conducted in nine schools with twenty-four classes, kindergarten through second grade, with a student/teacher ratio of 14:1. This project was proposed in the 1980s by the former Governor of Indiana, Robert D. Orr, and the former Superintendent of Public Instruction, Harold H. Negley. After two semesters of implementation of the program, the project was considered successful as the students excelled above the normal achievement ratings in both math and reading (Varble, 1990). Odden (1990) reports on McGiverin, Gilman and Tillitski's summarization of Indiana's Prime Time project. Students in small classes with an average of 19 students were reported to outperform students in large classes with an average of 26 students by .34 standard deviation over a two year time frame.

Tennessee's Project STAR (Student/Teacher Achievement Ratio) was a four-year study proposed in a 1985 bill by Steve Cobb, the chief sponsor of the Better Schools program in the Tennessee House of Representatives. The bill was passed in May 1985, and the study was implemented in August 1985 (Folger, 1989). The study was funded by the State of Tennessee, directed by Dr. Elizabeth Word, and conducted by four Tennessee universities. A small pilot study was first conducted in grades 1-3 in which students were compared in large classes of 25

students to small classes of 15 students. At the end of first grade, achievement outcomes were promising (Slavin, 1990).

For the STAR study 6,500 kindergartners across the state were drawn as a random sample for three groups defined by different student-teacher ratios: regular classes with 22-25 students, regular classes with aides, and small classes of 13-17 students. These students remained in the assigned class through third grade (Slavin, 1990). The conclusions of the study were that the maximum effect of reducing class size particularly benefited students in kindergarten and grade one. Students in kindergarten through third grade from the small classes in rural, suburban, urban, and inner-city schools made the highest scores on the Stanford Achievement Test and Basic Skills First Test (Word, Johnston, Pate-Bains, Fulton, Zaharias, Achilles, Lintz, Folger, & Breda, 1990). In addition, the study found that small classes seem to help both high and low socioeconomic students (Folger & Breda, 1989).

Smaller classes also reduced grade retention in Project STAR's four year longitudinal study. Only 17 percent of students who were involved in the small classes have been held back before tenth grade compared to 30 to 44 percent of the students in regular-sized classes. This finding is important to note as past research has shown that students who are retained have a greater

chance of not graduating as students with equal abilities (Folger & Breda, 1989; NEA Today, 1998).

After the Project STAR was completed, a Lasting Benefits Study (LBS) was conducted to ascertain whether the gains from the small class size were maintained at the end of fourth grade, at which time the students were placed in regular-sized classes with 22-25 students. Tests were administered to 4,320 fourth-grade students who had been in a Project STAR class during third grade. Students' achievement in reading, language, math, science, study skills, and social science was assessed. The LBS found that the fourth-grade students who had been in the small classes in the Project STAR during third grade showed significant advantages for all achievement measures over Project STAR students from the other two class-size conditions no matter what school location they attended (Nye, Zaharias, Fulton, Achilles, & Hooper, 1991).

Recent findings from Project STAR show that small classes in the primary grades produce long-term benefits as well. Now tenth graders, the high school records of the children who participated in Project STAR have been reviewed by the original research team led by Dr. Helen Pate-Bains. They concluded that the Project STAR students in small classes had taken significantly more advanced college preparatory classes; scored more than ten points higher in high school math, science, and English; and consistently had fewer absences and suspensions from

high school than the Project STAR students who were in regular-sized classes or regular-sized classes with an aide (NEA Today, 1998).

Slavin (1990) states that the Project STAR research study has contributed greatly to the literature on class size with its research design and findings.

Other Studies of the Effects of Class Size

Positive impacts associated with small class size are reported in many articles summarizing class size research (Egelson, Harman, & Achilles, 1996; Folger & Breda, 1989; Folger, 1989; Johnston, 1990; Kemp, 1990; Odden, 1990). Teachers' classroom attitudes and behaviors are more positive in classes that are smaller. Odden (1990) refers to Smith and Glass' meta-analysis of research on class size and classroom practices. The meta-analysis found that teachers interacted with students more and instruction was more individualized and that teachers believed that they were effective in small classes.

Odden (1990) also reports on Filby, Cahen, McCutcheon, and Kyle's case study of teacher behavior in small classes. This study concluded that teachers in small classes believed that they had more time to develop the curriculum and to provide more in-depth enrichment activities. Classroom management was also less fraught with discipline problems. Students were reported to have fewer absences and were more attentive to their class work

because they had less time to wait for teachers' assistance and they received more individualized instruction (Odden, 1990).

The advantages listed in these case studies are especially important in early childhood programs because they support a developmentally appropriate classroom as referred to in the NAEYC position statement on instructional practices (Bredekamp, 1988).

Other benefits of small class size are reported by Robert Slavin (1990). He mentions that teachers are able to be more innovative when teaching which may be due to smaller classes. Teachers who implement developmentally appropriate practices can be more innovative when they have time to plan and prepare the learning environment so children can experience active involvement with each other and adults. Such a learning environment offers many options for learning experiences throughout the instructional program involving all areas of the curriculum (Bredekamp, 1988). Slavin also adds that school districts may have more appeal to attract and retain quality teachers if small class sizes exist (Slavin, 1990).

In addition, class size research has shown that economically disadvantaged and some ethnic minority students have higher academic achievement in smaller classes. Five studies (Castiglione & Wilsberg, 1968; Wagner, 1981; Doss & Holley, 1982; Cahen et al., 1983; Whittington et al., 1985) found that small classes improved the achievement of disadvantaged or minority

students. Project STAR data shows that 12.7% more minority students who were enrolled in small classes passed the Tennessee basic skills test for the reading section and 9.9% more for the math section than minority students who were enrolled in large classes. It was also reported in the Project STAR data that students in small classes of 15 students did overwhelmingly better than minority students in large classes of 25 by the end of grade two (Robinson, 1990).

Finally, teachers have more time to observe and assess each student's academic and personal social abilities in small classes. The student's needs are met more appropriately because the teachers have had more time to accurately assess each student (Egelson, Harman, & Achilles, 1996; Kemp, 1990). Teachers have more time to observe and record in the form of narrative comments on each child's progress and instructional needs as recommended by NAEYC (Bredekamp, 1988). Teachers also have more time to communicate with parents about their children's educational progress (Egelson, Harman, & Achilles, 1996; Kemp, 1990). NAEYC emphasizes the importance of teachers listening to parents to extend their understanding of their students as a developmentally appropriate component in primary classrooms. Thus, NAEYC recommends periodic parent-teacher conferences and school visits by the parents (Bredekamp, 1988).

If the cost of reducing class size were not an issue, the economic pressure of increasing class size would not exist. Odden (1990) refers to Guthrie and Kirst's example of the cost impact due to class size reduction. For example, California would spend between $200 and $250 million to reduce class size by one student.

Economic feasibility to reduce class size in primary grades may soon be possible for schools throughout the United States of America. President Bill Clinton has proposed funding for states to help lower class size (NEA Today, 1998). In addition, an education reform bill proposed by the Iowa House of Representatives for the 1998 session includes a $10 million block grant to be used to reduce class size, increase parental involvement, and teach phonics (Communique, 1998). NEA Today (1998) reports that at least 27 other states have also proposed bills to reduce class size. California, Alabama, and Tennessee have all pushed to get primary grades to a student/teacher ratio of twenty or fewer to one. In 1996, California's Governor Wilson and the Legislature developed a $1 billion voluntary program for state school districts to lower class size in kindergarten through grade two. In January 1997, this state proposed another $300 million to include grade three (Anderson, 1997).

Another important matter to take into consideration is that reducing class size alone will only have a small effect on the

children's academic achievement. Teachers have to capitalize on all the reduced class size advantages to impact the academic achievement of students. The curriculum taught, teaching strategies, and classroom evaluation are all factors that influence the student's academic achievement (Folger, 1989; Harder, 1990; Holliday, 1992; Kemp, 1990; and Slavin, 1990). Therefore, it is of utmost importance that staff development sessions are organized to inform and encourage teachers to learn about developing and implementing new techniques that will help make the most of each child's academic capabilities when in small classes (Robinson, 1990; Johnston, 1990). Providing additional space, equipment, utilities and materials are other problems that occur when reducing class size (Harder, 1990).

Class Size Policies

A number of reduction policies can be used by school districts to reduce the class size in the primary grades. The most commonly used reduction policies include reducing the class size by hiring an additional teacher, implementing tutoring programs, or using grouping strategies with students throughout the day to reduce class size during reading and math classes (Odden, 1990; Slavin, 1989).

The most ideal class size reduction policy is to hire teachers for each primary class that exceeds the maximum recommended number of students for that grade level.

Administrators have fewer concerns about in-service and continued maintenance with this class size reduction policy (Slavin, 1990). The difficulty associated with this strategy is the expense (Cahen, Filby, McCutcheon, & Kyle, 1983). When funding is limited, the most cost effective approach would be to reduce the class size of the kindergarten and first grade classes by hiring additional teachers (Folger & Breda, 1989).

Due to the difficulties of funding class size reduction for all grade levels, other policies have been suggested (Cahen, Filby, McCutcheon, & Kyle, 1983; Folger & Breda, 1989; Johnston, 1990; Odden, 1990; Robinson, 1990; Slavin, 1990). One such policy would allow class size reduction for a part of the school day.

Tutoring is another policy that allows additional support for students who are academically below grade. The students in a group of no more than three would work with a teacher for a twenty to thirty minute period each day. Studies suggest that tutoring is a policy that can significantly help students improve academically (Odden, 1990; Robinson, 1990). In addition to school personnel, peer and adult volunteer tutors can offer support to students. Tutoring allows a reduction in class size for a small portion of each school day and can supplement any grouping strategies.

Several grouping strategies that can provide smaller class sizes in self-contained primary classes are: (1) An additional

reading teacher to be shared by more than one classroom (Odden, 1990; Slavin, 1990); (2) Student arrival and dismissal times are staggered; Half the students arrive an hour earlier and the other half are dismissed an hour later, allowing for reading to be taught to smaller groups (Odden, 1990); (3) Regrouping and combining several primary grades for physical education, social studies, and music can allow more time for reading instruction with a smaller number of students (Cahen, Filby, McCutcheon, & Kyle, 1983; Odden, 1990); and (4) Classroom aides can be hired to make instruction more individualized (Johnston, 1990). Grouping students according to the grouping policies listed would help reduce class size for a portion of the day and ". . . allow teachers to use teaching strategies that involve direct interaction with a manageable group of students" (Folger & Breda, 1989, p. 32).

School districts need to consider all the possibilities before implementing any class size reduction policy within their school system. After the strategy is implemented, it needs to be frequently evaluated for its effectiveness in meeting the needs of the students and the school district.

Summary

The positive effects associated with class size reduction need to be seriously taken into consideration when making decisions on class size policies in the primary grades.

Government agencies, educators, and the community need to collaborate to provide the funding necessary to reduce class size to the recommended student/teacher ratios suggested by the NAEYC and the Iowa DOE.

Early childhood class size research is limited and needs to continue. Two major studies on class size in primary classrooms, Indiana's PRIME TIME project and Tennessee's STAR project, were conducted in the 1980s. These studies reported the positive impacts on children's learning. More research on class size in the primary grades will help support the reduction policies in early childhood classrooms. With new legislation reported in many states, researchers should document and report findings on the outcomes of the reduction of class size in the primary grades.

Since our school district's decision to reduce class size in the primary grades, I observe the advantages of reduced class size. Our school district chose the reduction policy of hiring an additional teacher; thus, there were three sections of kindergarten with 20 or fewer students in each section. One section also has an aide who helps with a special needs student. Observations of daily student performance indicate that these young children appear to interact more during instruction. Their test scores show that they are achieving in the area of understandings and skills more successfully. As a teacher, I was able to offer more individualized instruction and get support for

two students that were found to have special needs. Retention would have been recommended for one of these special needs students, but with early intervention, the student was able to succeed in a class with fewer students.

The biggest obstacle for our school district was not the funding but finding a space for a third classroom. Our administration decided to place the third section on the second floor in a classroom one-third the size of the two existing kindergarten rooms. In addition to the problem of the limited size, it had to be approved by the state fire marshal as suitable for kindergarten and grade one classrooms. By law, such classrooms need to be on ground level. The teacher in this small classroom was given 15 students. The equipment and materials for each classroom were shared to help diminish the costs of the additional section of kindergarten.

One kindergarten teacher will move with the class as the students are promoted to the next grade level. The additional section will remain during the primary grade school years as long as the whole class has over 50 students registered.

I hope that our school district's success in choosing smaller class sizes for primary grade children will help other school districts to implement class size reduction policies that will better meet the needs of their students. By reading the research done in early childhood classrooms, one can note the

many benefits it can produce when implemented effectively during the primary years.

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